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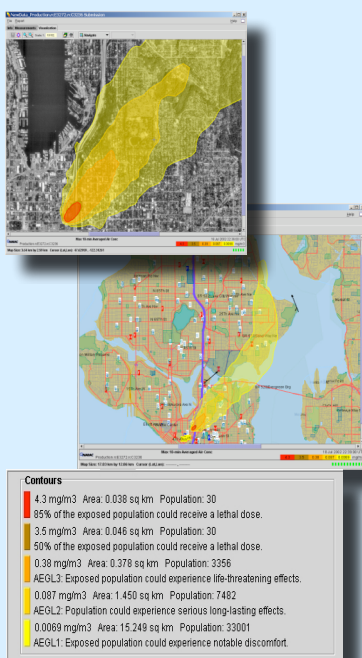
NARAC

National Atmospheric Release Advisory Center

OVERVIEW

The National Atmospheric Release Advisory Center (NARAC) provides tools and services that map the spread of hazardous material accidentally or intentionally released into the atmosphere. Located at the University of California's Lawrence Livermore National Laboratory (LLNL), NARAC is a national support and resource center for planning, preparedness, real-time emergency response, and threat assessments involving nuclear, radiological, chemical, biological or natural emissions. NARAC predictions provide information on affected areas and populations, potential casualties, health effects, and protective action guides to assist decision makers and responders (for more information, see http://narac.llnl.gov). On April 15, 2004, the Homeland Security Council designated NARAC as the interim provider for the new DHS-led Interagency Modeling and Atmospheric Assessment Center (IMAAC), whose role under the National Response Plan is to serve as the single source of federal atmospheric dispersion predictions during Incidents of National Significance.

NARAC is a distributed system, providing airborne plume modeling and geographical information tools for deployment to an end user's computer system, as well as real-time access to an advanced suite of three-dimensional models from the national center. This system includes extensive global meteorological and geographical databases. Initial predictions using NARAC/IMAAC software tools are available in less than a minute using only the end user's computer. This same software allows access to fully-automated 3-D LLNL plume model predictions in 5 to 15 minutes. NARAC provides technical and scientific subject matter expertise — including refined predictions and quality assurance of model input data and predictions — until all airborne releases end, the hazardous areas are defined and mapped, and the long-term impacts are assessed.

SPONSORSHIP

DOE, DHS and DOD provide core funding for the LLNL center operations. DOE/NNSA Emergency Operations (NA-40) provides the primary base operational funding for NARAC. LLNL's support of the Interagency Modeling and Atmospheric Assessment Center (IMAAC) is funded via the DHS Science & Technology (S&T) Directorate. The DoD/DOE Naval Reactor Program uses NARAC to provide emergency response for its sites. DOE/NNSA's International Emergency Management and Cooperation (IEMC) Program (NA-23) provides funding for LLNL work to help strengthen worldwide emergency preparedness and to develop capabilities to respond to international nuclear accidents. Additional support is provided through the LLNL Nonproliferation, Arms Control and International Security (NAI) Directorate and the Homeland Security Office in support of DHS, DOE, DoD and other agency missions.

LLNL's research and development efforts are currently funded from DHS S&T for urban and chemical/biological agent capabilities; DOE Technology Integration for radiological / nuclear tools; and internal LLNL funding to develop cutting-edge capabilities such as event reconstruction for characterizing sources based on field measurement data.

Contours

4.3 mg/m3 Area: 0.038 sq km Population: 30
85% of the exposed population could receive a lethal dose.

3.5 mg/m3 Area: 0.046 sq km Population: 30
50% of the exposed population could receive a lethal dose.

0.38 mg/m3 Area: 0.378 sq km Population: 3356
AEGL3: Exposed population could experience life-threatening effects.

0.087 mg/m3 Area: 1.450 sq km Population: 7482
AEGL2: Population could experience serious long-lasting effects.

0.0069 mg/m3 Area: 15.249 sq km Population: 33001
AEGL1: Exposed population could experience notable discomfort.

NARAC predictions provide key information to decision makers
- Plume hazard areas
- Expected health effects
- Protective action recommendations (e.g. sheltering, evacuation)
- Affected population counts
- Key facilities
- Approach and evacuation routes

SUPPORTED AND COLLABORATING ORGANIZATIONS

Under the auspices of DOE, DHS and DOD, the LLNL center supports a large number of organizations. The core customer base, established in the 1970s and 1980s, includes DOE headquarters, DOE Nuclear Incident Response Teams, DOE sites, DOE regions, the DoD/DOE Naval Reactor sites and DoD facilities. NARAC also supports the Federal Radiological Monitoring and Assessment Center (FRMAC). Under the IMAAC, LLNL supports the DHS Homeland Security Operations Center (HSOC), the FEMA National Response Coordinating Center and Regional Response Coordinating Centers, as well as IMAAC agency stakeholders (currently DHS, DoD, DOE, EPA, NASA, NOAA/DOC, NRC, with negotiations underway to add HHS and DOT).

ACTIVITIES

The LLNL center provides training, exercises, and/or emergency support for over 300 collaborating local, state, and federal agencies, response teams and emergency operations centers, with over 1700 on-line users. Annually, LLNL supports thousands of automated 3-D plume model simulations for tests and drills by end users, roughly 100 exercises with extensive LLNL staff involvement in planning and execution, 2-4 major national exercises, and approximately 20 real-world alerts and emergencies per year involving potential hazardous material releases into the atmosphere.

Contact Information:

Dr. Gayle Sugiyama
Program Leader
NARAC/IMAAC Program
925.422.7266
sugiyama@llnl.gov

Dr. John Nasstrom
Associate Program Leader, Operations Center
NARAC/IMAAC Program
925.423.6738
nasstrom1@llnl.gov

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